

# THE EMERALD CONFERENCE

Produced by MJBizScience

February 27 - March 1, 2022  
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## **Cannabinoids Analysis of Hemp Derived Products- Developing Methods That are Robust and Dependable**

**Presenter: Sunil Badal, Ph.D., Senior Scientist, MilliporeSigma**

**Abstract:** Legalization and use of hemp, recreational and medical cannabis is expanding globally. Cannabidiol (CBD) and Tetrahydrocannabinol (THC) containing cannabis products are consumed in various forms such as flower to vape-pens, edibles, concentrates, tinctures, beverages, topicals, capsules, etc. In the United States, these hemp, CBD and cannabis products need to be tested to ensure accurate label of contents and consumer safety. A research study found that only 17% of edible products were accurately labeled when 75 different cannabis infused edible products were tested.<sup>1</sup> Due to the complexity of cannabis product matrices, sample preparation for cannabinoid testing is very challenging. Accurate extraction and analysis procedures are required to ensure proper regulation of these products. In this study, we explored simple and accurate sample preparation methods for analysis of cannabinoids from several matrices.

Cannabinoids from hemp bud, hemp oil, chocolate, hard candy, gummy, cream, and beverage matrices were extracted with methods such as liquid extraction, QuEChERS,<sup>2</sup> etc. Extraction efficiency and repeatability with different solvents and extraction methods were studied using HPLC/DAD and HPLC/MS analysis methods. Different varieties of each matrix type were also tested to evaluate matrix effects on extraction efficiency. Multiple injections of filtered and unfiltered extracts were tested to assess column robustness. Fused-Core<sup>®</sup> particle C18 and monolithic columns demonstrated accurate, precise and robust quantitation of cannabinoids. The challenges of sample preparation and the methods to overcome them will be discussed during the presentation.